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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,856	MAYS, ROBERT	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-5, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horner et al. (US Patent No. 4359259) in view of Quick et al. (US Patent No. 4296994).

Regarding claim 1, Horner et al. disclose a communication system comprising: a source of energy to propagate a signal along a communication path (fig. 3, element 50 and 51 and col. 6, lines 20-24); a detector positioned in the communication path (fig. 3, elements 52 and col. 6, lines 40-45); and a filtering system disposed in the optical path, the filtering system having a transform function associated therewith (fig. 3, elements 50, 40, and 52, col. 2, lines 36-45 and col. 6, lines 25-40). Horner et al. disclose multi-wavelength holographic filtering, but do not disclose encoding the signal, defining an encoded signal, and decoding the encoded signal to retrieve the signal for detection by the detector. Quick et al. disclose data transmission with multi-wavelength holographic filtering, where the holograms are used to encode and decode the signal (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filters for encoding and decoding disclosed by Quick et al. could be used in the system of Horner et al. to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 3, Horner et al. in view of Quick et al. disclose the system as recited in claim 1 wherein the first and second filtering system is a transmissive element, allowing the

signal to propagate between opposing surfaces thereof (Horner et al.: fig. 3 and col. 2, lines 36-45).

Regarding claim 4, Horner et al. in view of Quick et al. disclose the system as recited in claim 1 wherein the filtering system is a reflective element, allowing the signal to enter and exit the element through a common surface (Horner et al.: fig. 6 and col. 2, lines 36-45).

Regarding claim 5, Horner et al. in view of Quick et al. disclose the system as recited in claim 1 wherein the signal is an optical signal (Horner et al.: col. 2, lines 26-35).

Regarding claim 15, Horner et al. disclose a communication system comprising: a source of energy to propagate a signal along a communication path (fig. 3, element 50 and 51 and col. 6, lines 20-24); a detector positioned in the communication path (fig. 3, elements 52 and col. 6, lines 40-45); and a filtering system disposed between the source and the detector (fig. 3, elements 50, 40, and 52, col. 2, lines 36-45 and col. 6, lines 25-40). Horner et al. disclose multi-wavelength holographic filtering, but do not disclose that the filtering system has first and second filtering apparatus for encoding and decoding. Quick et al. disclose data transmission with multi-wavelength filtering, the filtering system having first and second filtering apparatus, each of which has a transform function associated therewith, with the first filtering apparatus encoding the signal, defining an encoded signal, and the second filtering apparatus decoding the encoded signal to retrieve the signal for detection by the detector (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic encoding filter and decoding filter, as disclosed by Quick et al., could be used in the system of Horner et al. to provide encoding and decoding of the source signal for increased security of data transmission.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horner et al. (US Patent No. 4359259) in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 3-5, and 15 above, and further in view of Hoshino et al. (US Patent No. 5442433), and further in view of Horner et al. (US Patent No. 4392709).

Regarding claim 2, Horner et al. (4359259) in view of Quick et al. disclose the system as recited in claim 1 wherein the filtering system removes unwanted wavelength characteristics from the signal. Horner et al. (4359259) do not disclose removing unwanted amplitude, polarization, and phase characteristics from the signal. Hoshino et al. disclose a holographic filter in a communication path between a source and detector (col. 3, line 43 to col. 4, line 35), where a polarization film is applied to the holographic filter to remove unwanted characteristics from the signal (col. 5, lines 13-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the polarization film disclosed by Hoshino et al. to the surface of the holographic filter of Horner et al. to remove unwanted polarization characteristics from the signal. Also, Horner et al. (4392709) disclose a holographic element for filtering amplitude and phase characteristics in integrated optic systems (col. 1, lines 13-58). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filter of Horner et al. (4359259) could also be recorded to filter amplitude and phase characteristics in addition to filtering wavelength and polarization characteristics, in order to provide expanded filtering capabilities.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horner et al. (US Patent No. 4359259) in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 3-5, and 15 above, and further in view of Brandsetter (US Patent No. 5103324), and further in

view of United States Frequency Allocations–1996 (http://www.autoid.org/documents/freqallochrt.pdf).

Regarding claim 6, Horner et al. in view of Quick et al. disclose the system as recited in claim 1, but do not disclose that the signal is an RF signal having a wavelength in the range of 1 micron to 1 millimeter, inclusive. Brandsetter discloses a holographic filter for removing unwanted characteristics from RF signals (col. 1, lines 5-20 and col. 1, line 61 to col. 2, line 2). In addition, the United States Frequency Allocations–1996 discloses that the wavelength range of RF signals in the electromagnetic spectrum is from 1 millimeter to 100 kilometers, and thus a signal in the range 1 micron to 1 millimeter is inherently not an RF signal. It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filter of Horner et al. could be used to filter RF signals, as disclosed by Brandsetter.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horner et al. (US Patent No. 4359259) in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 3-5, and 15 above, and further in view of Baney et al. (US Patent No. 6486984).

Regarding claim 7, Horner et al. in view of Quick et al. disclose the system as recited in claim 1 wherein the source of energy includes a transmitter to generate a signal to propagate along an axis and the detector includes a receiver, which is positioned to sense the signal propagating along the axis and the filter is disposed in the axis, with the holographic transform disposed in a volume of the filter. Horner et al. in view of Quick et al. disclose an array of receivers (Horner et al.: fig. 3, elements 52-54), but do not also disclose an array of transmitters, and an array of filters, with a plurality of axes, each axis representing a signal path from a transmitter, to a filter and then to a receiver. Baney et al. disclose an array of transmitters, an array of filters, and an array of detectors in a communication system, with a plurality of axes,

each axis representing a signal path from a transmitter to a filter to a receiver (fig. 1 and col. 3, line 40 to col. 4, line 10). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple transmitters, filters and receivers, each of the type disclosed by Horner et al. in view of Quick et al., arranged and aligned as disclosed by Baney et al., to provide filtering for multiple components of the signal.

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horner et al. (US Patent No. 4359259) in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 3-5 and 15 above, and further in view of Baney et al. (US Patent No. 6486984), and further in view of Ash et al. (US Patent No. 4057319).

Regarding claim 8, Horner et al. in view of Quick et al. disclose the system as recited in claim 1 wherein the source of energy includes a transmitter to generate energy to propagate along an axis and a detector receiver, positioned to sense energy propagating along the axis and a filter which has a holographic transform function within a volume thereof. Horner et al. in view of Quick et al. disclose an array of receivers (fig. 3, elements 52-54), but do not also disclose an array of transmitters, and an array of filters, with a plurality of axes, each axis representing a signal path from a transmitter, to a filter and then to a receiver. Baney et al. disclose an array of transmitters, an array of filters, and an array of detectors in a communication system, with a plurality of axes, each axis representing a signal path from a transmitter to a filter to a receiver (fig. 1 and col. 3, line 40 to col. 4, line 10). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple transmitters, filters and receivers, each of the type disclosed by Horner et al. in view of Quick et al., arranged and aligned as disclosed by Baney et al., to provide filtering for multiple components of the signal. In addition, Horner in view of Hoshino et al. and further in view of Baney et al. do not

disclose first and second filter arrays, the first array being disposed between the array of transmitters and the array of receivers and the second array being disposed between the first array and the receivers. Ash et al. disclose a pair of holographic filters, with paired holographic transform functions within their volumes, the first disposed between an array of transmitters and the receiver and the second disposed between the first and an array of receivers (fig. 2, elements 14 and 34 and col. 2, lines 16-50 and col. 3, line 57 to col. 4, line 34), useful for low crosstalk transmission between individual transmitters and receivers within the arrays (col. 1, lines 7-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use paired holographic filters of Ash et al., in the array system of Horner et al. in view of Quick et al. and further in view of Baney et al., in order to provide low crosstalk transmission between individual transmitters and receivers within the arrays.

Regarding claim 9, Horner et al. in view of Quick et al., further in view of Baney et al., and further in view of Ash et al. disclose the system as recited in claim 8, but do not disclose the holographic transform function associated with a subgroup of the filters of the first array, defining a transfer function, differs from the holographic transform function associated with the remaining filters of the first array of filters, and the holographic transform function associated with a subset of the filters of the second array matches the transfer function. However, Ash et al. disclose a single pair of holographic filters recorded with multiple transform functions corresponding to different axes between individual transmitters and receivers within the arrays, for individual low crosstalk transmissions between each transmitter and receiver set. It would have been obvious to one of ordinary skill in the art at the time of the invention that multiple pairs of filters, each recorded with an individual transform function (as opposed to one filter with multiple transform functions), could be used for the individual axes of transmission between transmitters and receivers of the arrays.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-20 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 09/851857 in view of Quick et al. (US Patent No. 4296994).

This is a provisional obviousness-type double patenting rejection.

Regarding claim 1, Application No. 09/851857 claims a communication system comprising: a source of energy to propagate a signal along a communication path; a detector positioned in the communication path; and a filtering system disposed in the optical path, the filtering system having a transform function associated therewith, and detection of the signal by the detector (claim 1). Also claimed are first and second filters (claim 8). Application No. 09/851857 does not claim encoding the signal, defining an encoded signal, and decoding the encoded signal to retrieve the signal for detection by the detector. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filters for encoding and decoding disclosed by Quick et al. could be used in the

system of 09/851857 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 2, Application No. 09/851857 claims the system as recited in claim 1 wherein the filtering system removes unwanted characteristics from the signal with the unwanted characteristics being selected from a group consisting essentially of amplitude, polarization, wavelength and phase (claim 2).

Regarding claim 3, Application No. 09/851857 claims the system as recited in claim 1 wherein the first and second filtering system is a transmissive element, allowing the signal to propagate between opposing surfaces thereof (claim 3).

Regarding claim 4, Application No. 09/851857 claims the system as recited in claim 1 wherein the filtering system is a reflective element, allowing the signal to enter and exit the element through a common surface (claim 4).

Regarding claim 5, Application No. 09/851857 claims the system as recited in claim 1 wherein the signal is an optical signal (claim 5).

Regarding claim 6, Application No. 09/851857 claims the system as recited in claim 1 wherein the signal is an RF signal having a wavelength in the range of in the range of 1 micron to 1 millimeter, inclusive (claim 6).

Regarding claim 7, Application No. 09/851857 claims the system as recited in claim 1 wherein the source of energy includes an array of transmitters to generate a plurality of the signals to propagate along a plurality of axes and the detector includes an array of receivers, each of which is positioned to sense one of the plurality of signals propagating along one of the plurality of axes and the filtering system includes an array of filtering systems, each of which is disposed in one of the plurality of axes, with a subset of the filtering systems of the array having

a surface with the polarizing film being recorded thereon and the holographic transform disposed in a volume thereof (claim 7).

Regarding claim 8, Application No. 09/851857 claims the system as recited in claim 1 wherein the source of energy includes an array of transmitters to generate energy to propagate along a plurality of axes and the detector includes an array of receivers, each of which is positioned to sense energy propagating along one of the plurality of axes and the filtering system includes a plurality of filtering systems, each of which has a holographic transform function recorded within a volume thereof, with the plurality of filtering systems being arranged in first and second arrays, the first array being disposed between the array of transmitters and the array of receivers and the second array being disposed between the first array and the receivers (claim 8).

Regarding claim 9, Application No. 09/851857 claims the system as recited in claim 8 wherein the holographic transform function associated with a subgroup of the filtering systems of the first array, defining a transfer function, differs from the holographic transform function associated with the remaining filtering systems of the first array of filtering systems, and the holographic transform function associated with a subset of the filtering systems of the second array matches the transfer function (claim 9).

Regarding claim 10, Application No. 09/851857 claims the system as recited in claim 1 wherein the filtering system includes an optical element has opposed sides with a spherical surface being positioned on one of the opposed sides and a planar surface being disposed on the remaining side of the opposed sides with the holographic transform function being recorded within a volume of the lens between the spherical and the planar surfaces (claim 10).

Regarding claim 11, Application No. 09/851857 claims the system as recited in claim 1 wherein the filtering system is an optical element having opposed sides with a cylindrical

surface being positioned on one of the opposed sides and a planar surface being disposed on the remaining side of the opposed sides, with the holographic transform function being recorded within a volume of the lens between the cylindrical and the planar surfaces (claim 11).

Regarding claim 12, Application No. 09/851857 claims the system as recited in claim 1 wherein the filtering system includes an optical element having opposed sides with a spherical surface being positioned on one of the opposed sides and a rotary symmetric arrangement of grooves defining a Fresnel lens being disposed on the remaining side of the opposed sides with the holographic transform function being recorded within a volume of the lens between the spherical surface and the Fresnel lens (claim 12).

Regarding claim 13, Application No. 09/851857 claims the system as recited in claim 1 wherein the source of energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes an array of lenses, each of which is disposed in one of the plurality of axes and includes the arcuate surface with the holographic transform being recorded within a volume of the array of lenses (claim 13).

Regarding claim 14, Application No. 09/851857 claims the system as recited in claim 1 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes a plurality of lenses having the arcuate surface with the holographic transform function recorded within a volume thereof, with the plurality of lenses being arranged in first and second arrays, the first array being disposed

between the array of optical transmitters and the array of optical receivers and the second array being disposed between the first array and the optical receivers (claim 14).

Regarding claim 15, Application No. 09/851857 claims a communication system comprising: a source of energy to propagate a signal along a communication path; a detector positioned in the communication path; and a filtering system disposed between the source and the detector, the filtering system having a transform function associated therewith (claim 15). Also claimed is the filtering system comprising first and second filters (claim 17). Application No. 09/851857 does not claim encoding the signal, defining an encoded signal, and decoding the encoded signal to retrieve the signal for detection by the detector. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filters for encoding and decoding disclosed by Quick et al. could be used in the system of 09/851857 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 16, Application No. 09/851857 claims the system as recited in claim 15 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes an array filtering systems lenses, each of which includes the first and second filtering apparatuses, disposed in one of the plurality of axes, with each of the first and second filtering apparatus defining a lens having an arcuate surface with the transform function being recorded within a volume thereof (claim 16).

Regarding claim 17, Application No. 09/851857 claims the system as recited in claim 16 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the optical system including a plurality of lenses having the arcuate surface with holographic transform function being disposed within a volume thereof, with the plurality of lenses being arranged in first and second arrays, the first array being disposed between the array of optical transmitters and the array of optical receivers and the second array being disposed between the first array and the optical receivers (claim 17).

Regarding claim 18, Application No. 09/851857 claims the system a communication system comprising: an array of optical transmitters to generate optical energy to propagate along a plurality of axes; an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes; a first array of refractory lenses, each of which is disposed in one of the plurality of axes and having a transform function recorded throughout a volume, with the transform function associated with a subgroup of the lenses of the first array differing from the transform function associated with the remaining lenses of the first array of lenses; and a second array of refractory lenses, each of which is disposed between the first array of lenses and the array of optical receivers to collect the encoded signal, with a subset of the lenses of the second array having a second transform function recorded in recorded in a second volume thereof, to retrieve the signal and directing the signal onto one of the optical receivers (claim 18). Application No. 09/851857 does not claim the first array encoding the signal and the second array decoding the encoded signal. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to

col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filter encoding and decoding disclosed by Quick et al. could be used for each filter pair in the first and second arrays of the system of 09/851857 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 19, Application No. 09/851857 claims the system as recited in claim 18 wherein the lenses of the first and second arrays have a spherical surface and an additional surface disposed opposite to the spherical surface, with a Fresnel lens being disposed on the additional surface (claim 19).

Regarding claim 20, Application No. 09/851857 claims the system as recited in claim 18 wherein the lenses of the first and second arrays have a cylindrical surface and an additional surface disposed opposite to the cylindrical surface, with a Fresnel lens being disposed on the additional surface (claim 20).

9. Claims 1, 5, and 8-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims (including amended and new) 1-14, 16, and 21-25 of copending Application No. 09/648847 in view of Quick et al. (US Patent No. 4296994).

This is a provisional obviousness-type double patenting rejection.

Regarding claim 1, Application No. 09/648847 claims a communication system comprising: a source of energy to propagate a signal along a communication path; a detector positioned in the communication path; and a filtering system disposed in the optical path, the filtering system having a transform function associated therewith, and detection of the signal by the detector (amended claim 1 and new claim 21). Also claimed are first and second filters (claim 4 and new claim 24). Application No. 09/648847 does not claim encoding the signal,

defining an encoded signal, and decoding the encoded signal to retrieve the signal for detection by the detector. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filters for encoding and decoding disclosed by Quick et al. could be used in the system of 09/648847 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 5, Application No. 09/648847 claims the system as recited in claim 1 wherein the signal is an optical signal (new claim 25).

Regarding claim 8, Application No. 09/648847 claims the system as recited in claim 1 wherein the source of energy includes an array of transmitters to generate energy to propagate along a plurality of axes and the detector includes an array of receivers, each of which is positioned to sense energy propagating along one of the plurality of axes and the filtering system includes a plurality of filtering systems, each of which has a holographic transform function recorded within a volume thereof, with the plurality of filtering systems being arranged in first and second arrays, the first array being disposed between the array of transmitters and the array of receivers and the second array being disposed between the first array and the receivers (claim 4 and new claim 24).

Regarding claim 9, Application No. 09/648847 claims the system as recited in claim 8 wherein the holographic transform function associated with a subgroup of the filtering systems of the first array, defining a transfer function, differs from the holographic transform function associated with the remaining filtering systems of the first array of filtering systems, and the holographic transform function associated with a subset of the filtering systems of the second array matches the transfer function (claim 5).

Regarding claim 10, Application No. 09/648847 claims the system as recited in claim 1 wherein the filtering system includes an optical element has opposed sides with a spherical surface being positioned on one of the opposed sides and a planar surface being disposed on the remaining side of the opposed sides with the holographic transform function being recorded within a volume of the lens between the spherical and the planar surfaces (amended claim 6).

Regarding claim 11, Application No. 09/648847 claims the system as recited in claim 1 wherein the filtering system is an optical element having opposed sides with a cylindrical surface being positioned on one of the opposed sides and a planar surface being disposed on the remaining side of the opposed sides, with the holographic transform function being recorded within a volume of the lens between the cylindrical and the planar surfaces (amended claim 7).

Regarding claim 12, Application No. 09/648847 claims the system as recited in claim 1 wherein the filtering system includes an optical element having opposed sides with a spherical surface being positioned on one of the opposed sides and a rotary symmetric arrangement of grooves defining a Fresnel lens being disposed on the remaining side of the opposed sides with the holographic transform function being recorded within a volume of the lens between the spherical surface and the Fresnel lens (amended claim 8).

Regarding claim 13, Application No. 09/648847 claims the system as recited in claim 1 wherein the source of energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes an array of lenses, each of which is disposed in one of the plurality of axes and includes the arcuate surface with the holographic transform being recorded within a volume of the array of lenses (amended claim 1 and claim 3).

Regarding claim 14, Application No. 09/648847 claims the system as recited in claim 1 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes a plurality of lenses having the arcuate surface with the holographic transform function recorded within a volume thereof, with the plurality of lenses being arranged in first and second arrays, the first array being disposed between the array of optical transmitters and the array of optical receivers and the second array being disposed between the first array and the optical receivers (amended claim 1 and claim 4).

Regarding claim 15, Application No. 09/648847 claims a communication system comprising: a source of energy to propagate a signal along a communication path; a detector positioned in the communication path; and a filtering system disposed between the source and the detector, the filtering system having a transform function associated therewith (claims 1 and 21). Also claimed is the filtering system comprising first and second filters (claim 4 and new claim 24). Application No. 09/648847 does not claim encoding the signal, defining an encoded signal, and decoding the encoded signal to retrieve the signal for detection by the detector. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filters for encoding and decoding disclosed by Quick et al. could be used in the system of 09/648847 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 16, Application No. 09/648847 claims the system as recited in claim 15 wherein the source of optical energy includes an array of optical transmitters to generate optical

energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the filtering system includes an array filtering systems lenses, each of which includes the first and second filtering apparatuses, disposed in one of the plurality of axes, with each of the first and second filtering apparatus defining a lens having an arcuate surface with the transform function being recorded within a volume thereof (amended claim 1 and claim 4; and new claims 21 and 24).

Regarding claim 17, Application No. 09/648847 claims the system as recited in claim 16 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the optical system including a plurality of lenses having the arcuate surface with holographic transform function being disposed within a volume thereof, with the plurality of lenses being arranged in first and second arrays, the first array being disposed between the array of optical transmitters and the array of optical receivers and the second array being disposed between the first array and the optical receivers (amended claim 1 and claim 4; and new claims 21 and 24).

Regarding claim 18, Application No. 09/648847 claims a communication system comprising: an array of optical transmitters to generate optical energy to propagate along a plurality of axes; an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes; a first array of refractory lenses, each of which is disposed in one of the plurality of axes and having a transform function recorded throughout a volume, with the transform function associated with a subgroup of the lenses of the first array differing from the transform function associated with the remaining

lenses of the first array of lenses; and a second array of refractory lenses, each of which is disposed between the first array of lenses and the array of optical receivers to collect the encoded signal, with a subset of the lenses of the second array having a second transform function recorded in recorded in a second volume thereof, to retrieve the signal and directing the signal onto one of the optical receivers (amended claim 1 and claims 4 and 5). Application No. 09/648847 does not claim the first array encoding the signal and the second array decoding the encoded signal. Quick et al. disclose data transmission with multi-wavelength holographic filtering, comprising first and second filters, used to encode and decode the signal respectively (fig. 9 and col. 7, line 23 to col. 8, line 20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filter encoding and decoding disclosed by Quick et al. could be used for each filter pair in the first and second arrays of the system of 09/648847 to provide encoding and decoding of the source signal for increased security of data transmission.

Regarding claim 19, Application No. 09/648847 claims the system as recited in claim 18 wherein the lenses of the first and second arrays have a spherical surface and an additional surface disposed opposite to the spherical surface, with a Fresnel lens being disposed on the additional surface (amended claim 8).

Regarding claim 20, Application No. 09/648847 claims the system as recited in claim 18 wherein the lenses of the first and second arrays have a cylindrical surface and an additional surface disposed opposite to the cylindrical surface, with a Fresnel lens being disposed on the additional surface (amended claim 9).

10. Claim 2 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims (including amended and new) 1-14, 16, and

21-25 of copending Application No. 09/648847 in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 5, and 8-20 above, and further in view of Horner et al. (US Patent No. 4392709).

Regarding claim 2, Application No. 09/648847 in view of Quick et al. claims the system as recited in claim 1 wherein the filtering system removes unwanted characteristics from the signal with the unwanted characteristics being selected from a group consisting essentially of polarization, wavelength and phase (new claim 22). Horner et al. disclose a holographic element for filtering amplitude and phase characteristics in integrated optic systems (col. 1, lines 13-58). It would have been obvious to one of ordinary skill in the art at the time of the invention that the holographic filter of Application No. 09/648847 could also be recorded to filter amplitude characteristics in addition to wavelength, phase and polarization characteristics, in order to provide expanded filtering capabilities.

11. Claim 7 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims claims (including amended and new) 1-14, 16, and 21-25 of copending Application No. 09/648847 in view of Quick et al. (US Patent No. 4296994) as applied to claims 1, 5, and 8-20 above, and further in view of Hoshino et al. (US Patent No. 5442433).

Regarding claim 7, Application No. 09/648847 claims the system as recited in claim 1 wherein the source of energy includes an array of transmitters to generate a plurality of the signals to propagate along a plurality of axes and the detector includes an array of receivers, each of which is positioned to sense one of the plurality of signals propagating along one of the plurality of axes and the filtering system includes an array of filtering systems, each of which is disposed in one of the plurality of axes, with a subset of the filtering systems of the array having

a surface and the holographic transform disposed in a volume thereof (new claim 24). Application 09/648847 does not disclose that the filters have a polarizing film disposed on their surfaces to remove portions of the signal having unwanted characteristics. Hoshino et al. disclose a holographic filter in a communication path between a source and detector (col. 3, line 43 to col. 4, line 35), where a polarization film is applied to the holographic filter to remove unwanted characteristics from the signal (col. 5, lines 13-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the polarization film disclosed by Hoshino et al. to the surface of the holographic filter of 09/648847. to remove unwanted polarization characteristics from the signal.

Conclusion

12. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (703) 305-0370. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

M.R. Sedighian

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